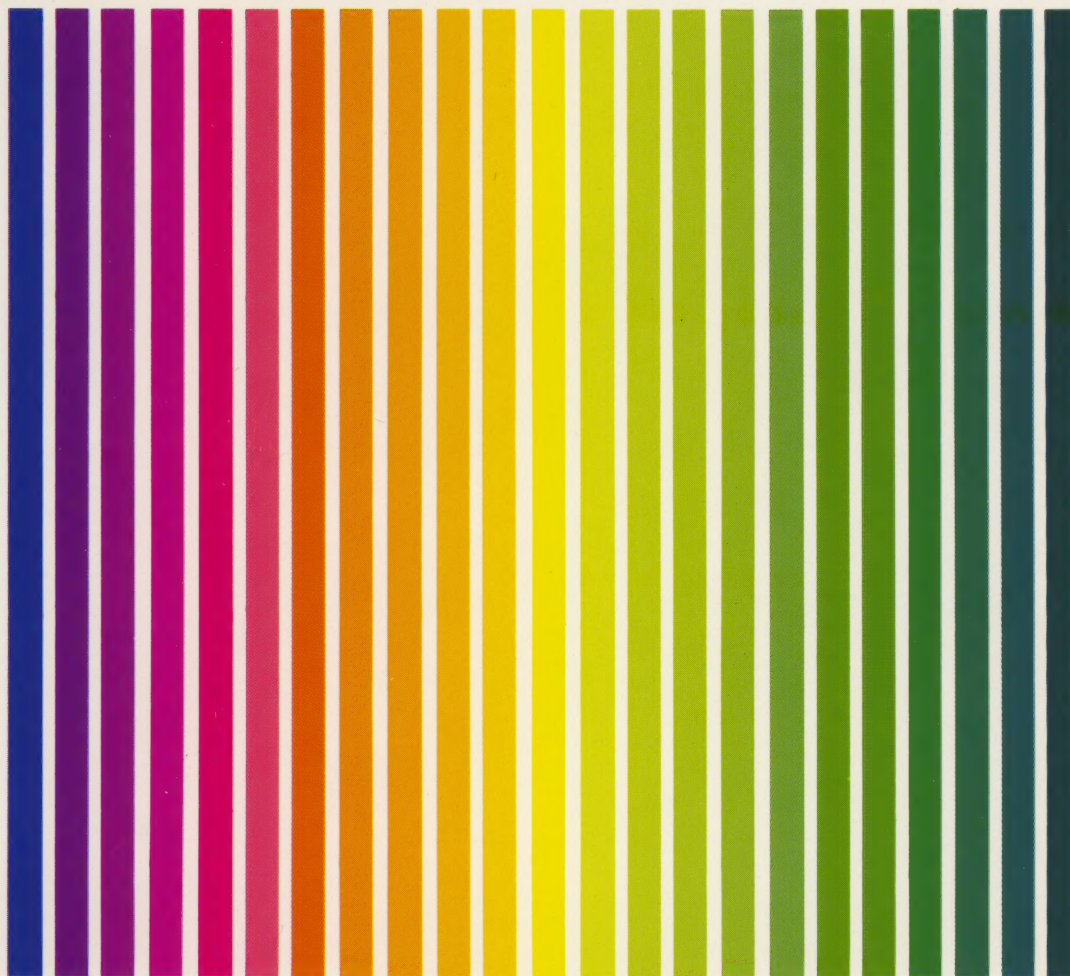


# **APX** ATARI® PROGRAM EXCHANGE



RLM Microsystems

## **UTILITY DISKETTE II**

Five ATARI BASIC file maintenance routines

Diskette: 24K (APX-20124)

User-Written Software for ATARI Home Computers



RLM Microsystems

# **UTILITY DISKETTE II**

Five ATARI BASIC file maintenance routines

Diskette: 24K (APX-20124)

UTILITY DISKETTE II

FOR MS-DOS 2.00 AND LATER

Copyright © 1987 by Microsoft Corporation

# UTILITY DISKETTE II

by

RLM Microsystems

Program and Manual Contents © 1982 RLM Microsystems

Copyright notice. On receipt of this computer program and associated documentation (the software), the author grants you a nonexclusive license to execute the enclosed software. This software is copyrighted. You are prohibited from reproducing, translating, or distributing this software in any unauthorized manner.

### **Distributed By**

The ATARI Program Exchange  
P.O. Box 3705  
Santa Clara, CA 95055

To request an APX Product Catalog, write to the address above, or call toll-free:

800/538-1862 (outside California)  
800/672-1850 (within California)

Or call our Sales number, 408/727-5603

### **Trademarks of Atari**

The following are trademarks of Atari, Inc.

ATARI®  
ATARI 400™ Home Computer  
ATARI 800™ Home Computer  
ATARI 410™ Program Recorder  
ATARI 810™ Disk Drive  
ATARI 820™ 40-Column Printer  
ATARI 822™ Thermal Printer  
ATARI 825™ 80-Column Printer  
ATARI 830™ Acoustic Modem  
ATARI 850™ Interface Module

Printed in U.S.A.

## CONTENTS

### INTRODUCTION

Overview	1
Required Accessories	1
Optional Accessories	1
Contacting the Authors	1

M (Menu)	2
----------	---

LISTER	4
--------	---

COMPARE	6
---------	---

HEXDUMP	8
---------	---

SORT	10
------	----

### ADVANCED TECHNICAL INFORMATION

System Elements & Design- SORT	12
Using Other Printers	13

## LIST OF FIGURES

### Figure

1. "M" Display Screen	2
2. LISTER options.	4
3. COMPARE options.	6
4. SORT Display.	10
5. Sample "LISTER" Output.	14
6. Sample "COMPARE" Output.	16





## INTRODUCTION

### OVERVIEW

The five utility programs comprising this diskette have varied functions.

M (Menu) displays the disk directoy and allows you to RUN any BASIC program by just typing a number. This is advantageous both for younger children and adults with two left hands.

LISTER produces a formatted listing of any BASIC program with all of the unprintable characters (both inverse-video and control) substituted. You may also print the key conversion table, headings and select print line width lines per page and character font.

COMPARE will analyze two versions of a BASIC program and display or print the lines or statements which do not match.

HEXDUMP will produce a formatted display or listing of either memory locations or disk files in the style familiar to most programmers (hex characters and ASCII representations).

SORT is a high-speed sort/merge using a "sub-list" algorithm. This will effectively allow the internal sorting of files that are much larger than available memory. It is a "stand-alone" utility that can be used to sort fixed or variable length records of up to 250 bytes long in either ascending or descending mode on any sort key.

### REQUIRED ACCESSORIES

- 24K RAM
- 810 Disk Drive
- ATARI BASIC Language Cartridge

### OPTIONAL ACCESSORIES

- ATARI 825 Printer or equivalent printer
- ATARI 850 Interface Module

### CONTACTING THE AUTHORS

Users wishing to contact the authors may write to them at:

- 168 Coachman Drive North
- Freehold, N.J. 07728
- or call (201) 431-2305

## M (MENU)

This program will display all of the entries on the disk directory and allow you to select one by typing a number. When you turn on the computer with any diskette containing "M" you would just have to type RUN "D:M" and the directory will be listed on your TV screen. You would then enter the number of the program that you wish to run. To load another program you can type RUN "D:M" again and the directory would re-appear. Instructions for copying "M" to other diskettes are located at the end of this section. "M" can also be automatically loaded if you copy the "AUTORUN.SYS" file to other diskettes.

The ATARI BASIC Language Cartridge must be in the left cartridge slot of your computer. Insert any diskette containing "M" into the disk drive. Turn on the disk drive and then your computer. The program will load automatically. The following will be displayed on your TV screen (note that the program names will be different for each diskette):

```
1 DOS.SYS
2 M
3 LISTER
4 COMPARE
5 HEXDUMP
6 SORT
7 SORTXX
8 SORT.SRC
9 SORT.OBJ
10 SORT.FIX
11 SORT.VAR
```

Figure 1. "M" display screen.

As many as 46 file names will be displayed depending on the number of programs located on the diskette. If there are more than 23, the balance will be displayed on the right side of the screen. Enter the number of the program that you wish to run and press the RETURN key. The prompt "LOADING filename" will appear vertically in the center of the display and the program will load. If for any reason the program cannot be loaded, "M" will display "CANT LOAD filename" and, after a brief pause, return you to the same selection prompt.

You may also type the number "0" instead of one of the numbers appearing on the display. This will cause "M" to reload the disk directory and display the new index. If you had changed diskettes before typing "0", the directory of the new diskette will display and you can load one of those programs.

"M" will only load BASIC programs that have been SAVED to diskette (as opposed to LISTed). It also cannot load machine language (binary) or ASSEMBLER text files (for example, SORT.OBJ and SORT.SRC on the UTILITY DISKETTE II diskette).

To copy "M" onto other diskettes in your library, first turn on your computer system with the UTILITY DISKETTE II diskette. When the READY prompt appears, type DOS and press the RETURN key. The ATARI DOS II menu will display. Type "O" for DUPLICATE FILE and press RETURN. Follow the instructions issued by DOS regarding inserting the source and destination disks. Copy both "AUTORUN.SYS" and "M" to the new diskette. Do not copy "M" to diskettes containing DOS I (09/24/79). "M" will not work on the earlier version of DOS.

## LISTER

LISTER will produce a formatted listing of any BASIC program with the unprintable inverse-video and control characters replaced with key symbols. The program to be printed must have been LISTED to the disk drive.

To load LISTER, insert the ATARI BASIC Language cartridge in the left cartridge slot of your computer. Insert the UTILITY DISKETTE II diskette into your disk drive. Turn on the disk drive and then the computer. When the READY prompt appears, type RUN "D:LISTER" and press RETURN. The program will load and display the following:

```
PROGRAM LISTER
  (C) 1982 RLM MICRO SYSTEMS

PROGRAM MUST BE IN LIST FORMAT.  JUST
PRESS RETURN TO CANCEL.

ENTER FILE NAME  =>?

INSERT XXXXXXXXX IN DISK DRIVE
PRESS RETURN

ENTER:

PRINT LINE WIDTH =>75
[C] NORMAL [C] COMPRESSED TYPE  =>?N
1st HEADER LINE
?
2nd HEADER LINE
?
# OF LINES/PAGE  =>?58
PRINT KEY LEGEND (Y/N)  Y
```

Figure 2. LISTER options.

First, type the name of the program that you want to print. If the program is in disk drive 1, you can type either NAME or D:NAME. If it's in disk drive #2, you must type D2:NAME. Press RETURN when you are finished.

Please note that the program to be printed must be in the LIST or "untokenized" format (as opposed to SAVE and "tokenized"). If it is not in LIST format, cancel LISTER by pressing RETURN without entering the name. Then LOAD the program and LIST it to the disk drive (for example, LIST "D:PROGNAME").

The next prompt is for the print line width. The number 75 is already displayed on the screen. Just press RETURN to enter this default value. Enter any other number (from 40 to 130) to change the default. The print line width is usually 80 for normal type font and 132 for the condensed (or compressed) type. This parameter controls the width of your listing. The smaller the number, the narrower the listing.

Select normal or compressed type by typing N or C to that prompt. The default is normal.

If you select normal, the line width entered above cannot be greater than 79. If it is greater, the program will re-display the line width prompt.

You may now enter two header lines that will be printed on the listing. The first header line will also appear at the top of every page on multi-page listings. Just press RETURN to skip these options.

The number of lines per printed page is entered next. The default is 58 and the maximum allowed is 63.

The last parameter controls the printing of the key legend on the first page of the listing. If you type "N", it will not appear. A "Y" will produce the table shown on the sample listing in figure 5.

The program will then display:

```
CHECK PRINTER & PAPER  
PRESS RETURN
```

Check that your printer and interface module are on and that the paper is positioned correctly in the printer. Press RETURN when you are ready. If the computer cannot send data to the printer, the warning will be re-displayed. If you are using a printer other than the ATARI 825 (e.g., EPSON MX-80), see the Advanced Technical Information section for instructions on how to modify the program for other printers.

After answering all of the above prompts, the listing will be produced. If a diskette related problem occurs during the processing, the message "DISK ERROR - XXX" will be displayed followed by "RUN AGAIN (Y/N) ?". The error number (XXX) relates to the error messages in the ATARI BASIC REFERENCE MANUAL - Appendix B. To re-run the LISTER program, type a "Y" in response to the last prompt.

## COMPARE

COMPARE will compare two BASIC programs line-by-line and print out all lines which do not match in the two programs. The two programs should be different versions of the same program. It would be meaningless to compare two totally different programs (all of the lines would be different). COMPARE will output the lines if one of the two programs does not have that line number or if the line numbers are equal but the statements are different. The "listing" can be on the screen or printer. The programs to be compared MUST both be in LIST format.

To load COMPARE, insert the BASIC cartridge in the left cartridge slot of the computer and the APX diskette in the 810 disk drive. Turn on the disk drive first and then the computer. When the READY prompt appears, type RUN "D:COMPARE" and press RETURN. The program will load and display the following:

```
BASIC PROGRAM COMPARISON
(C) 1982 RLM MICRO SYSTEMS

PROGRAMS MUST BE IN LIST FORMAT. JUST
PRESS RETURN TO CANCEL.

ENTER:

PROG 1 FILESPEC => ?
PROG 2 FILESPEC => ?

PRESS [SPACE] TO STOP

SELECT:

[S] SCREEN      [P] PRINTER =>?
[N] NORMAL      [C] CONDENSED TYPE =>
```

Figure 3. COMPARE options.

The two program names must be entered first. You may type either the full filespec (e.g. D:PROGNAME) or the program name (e.g. PROGNAME). If the programs are not located in disk drive 1, then you must type the full filespecification. Press RETURN after you enter each one. The programs to be compared MUST be in LIST format (as opposed to SAVE format). If they are not, you can convert them by LOADING each one and then LISTing each to the disk drive (e.g. LIST D:PROGNAME.LST).

You then enter your choice of screen display or printer hardcopy. The default is the printer. Type over the "P" with an "S" to select the screen. Press RETURN to register your selection.

Please note! when using the screen display and control characters (e.g. ESCAPE-CONTROL-CLEAR to clear the screen) output to the display will produce that function when printed on the screen. The display may clear or shift down by one line, etc.

The final option concerns the selection of either normal or condensed type for the

hardcopy listing. If you're using the screen output, this prompt won't appear.

If printer output was selected, the program will display:

```
CHECK PRINTER & PAPER  
PRESS RETURN TO CONTINUE
```

Check that the printer and interface module are on and that the printer is in "on-line" mode. If the program cannot send data to the printer, this message will be re-displayed. See the Advanced Technical Information Section for instructions on using printers other than the ATARI 825.

While the listing is being generated on either the printer or screen, you may halt it by pressing the SPACE bar. The following prompt will then be displayed:

```
[C] CONTINUE    [S] STOP
```

To continue the operation, type "C". To abort the procedure, type "S". For screen output, the display will automatically stop after each page and produce this prompt.

After all of the program lines have been examined, COMPARE will print an analysis of the comparison indicating how many lines are missing or do not match on each of the two programs. See figure 6 (page 16) for a sample of this analysis.

At the end of the processing or if you abort it, the program will display the prompt:

RUN AGAIN (Y/N) ?

Type Y to run the COMPARE program again.

## HEXDUMP

HEXDUMP will produce a formatted dump of either memory locations or disk files. You may dump any type of file including BASIC, binary, or data. The output can be directed to either the screen or printer. The format is dependent on the output device, producing either 8 byte or 16 byte lines with ASCII representations of the printable hexadecimal values.

To load HEXDUMP, insert the ATARI BASIC Language cartridge in the left cartridge slot of your computer and the program diskette in the disk drive. Turn on the disk drive and then the computer. When the READY prompt appears, type RUN"D:HEXDUMP" and press RETURN. The program will load and display:

```
HEX DUMP (C) 1982 RLM MICRO SYSTEMS
```

```
SOURCE - [M] MEMORY or [D] DISK ?  
PRESS RETURN TO CANCEL
```

Type either an "M" for memory locations or "D" for disk files. Press RETURN. If you choose the memory option, the following will display:

```
ENTER STARTING ADDRESS (HEX) =>  
      ENDING ADDRESS (HEX) =>
```

Enter the applicable addresses and press RETURN after each one.

For the disk file option, the display is:

```
ENTER FILE NAME =>
```

You may enter the filespecification (Dn:filename) or just the file name (filename). Then press RETURN.

The output prompt will then appear:

```
OUTPUT - [S] SCREEN or [P] PRINTER ?
```

Type an "S" for screen output or a "P" for the printer. Press RETURN. If you select the printer option, the messages "TURN PRINTER ON & CHECK PAPER" and "PRESS RETURN" will display. Verify that both the printer and interface module are on and that the printer is in "on-line" mode. If the program cannot send data to the printer, this prompt will reappear. Press RETURN to begin the process.

For the printer option, the message "PRESS ANY KEY TO HALT PRINTER" will display. After pressing any key, the following prompt will appear on the screen:

```
[C] CONTINUE [R] RESTART [S] STOP
```

To continue the listing, type "C". To restart the program, type an "R". To end the program and return to BASIC, type an "S".

This last prompt will also display when you've selected the screen option and the screen



is filled with HEX characters. Typing "C", "R" and "S" will result in the same action.

When the disk file or memory locations have been printed, the select "SOURCE" option will re-display. If the output went to the screen, you will have to press RETURN to clear the last display. The message "EOF" (end of file) indicates this condition.

## SORT

SORT is a high-speed sort utility based on a "sub-list" concept. The data file is divided into smaller segments that can each be sorted internally in computer memory. The small temporary files merge to complete the sort process. Therefore, a file, larger than available memory can be re-sequenced. The file can be either fixed or variable length records with a minimum record length of 2 bytes and a maximum of 250. The sort key can be located anywhere in the record and the program will sort in either an ascending or descending order. The utility is designed as a "stand-alone" and does not require interfacing with other programs. The source code for the machine language sort routine is included on the diskette.

To load SORT, insert the ATARI BASIC Language cartridge in the cartridge slot of your computer and the program diskette in your disk drive. Turn on the disk drive and then the computer. When the READY prompt appears, type RUN "D:SORT" and press RETURN. A "LOADING SORT/MERGE" message will appear as the machine language routine and main sort program are loaded. After the logo appears on the screen, the following will display:

```
FOR FILE TO BE SORTED, ENTER:

FIXED (F) OR VARIABLE LENGTH ?
RECORD LENGTH ?
SORT KEY (1st,2nd) ?
ASCENDING - 0 or DESCENDING - 1 ?
ENTER FILE NAME (Dn:name.ext)

DRIVE NUMBER FOR SORTED FILE ?

INSERT XXXXXXXX IN DRIVE n
AND BLANK DISK IN DRIVE n
PRESS RETURN ?
```

Figure 4. SORT display

The first prompt concerns the format of the file that will be sorted. Fixed length means that all of the records in the file are exactly the same length. Most DATA files processed by programs are of this type. Variable length implies that all of the records have different lengths. One may be 60 bytes long, the next may be 45, and so on. TEXT files generally are variable length. If you are not sure of the format of a particular file, specify VARIABLE. The algorithm in the variable length sort can handle fixed length records.

The next prompt is for the record length. Enter this number and press RETURN. The length must be a number between 2 and 250. The record length will be requested only if you had selected the fixed length option.

The sort key is required next. Enter the beginning and ending positions of the key in the record.

For example, if you are sorting a name/address file on Zip Code, which appears in the record in positions 49 through 53, enter 49,53 and press RETURN. The sort key must be within the physical record (e.g., you can't sort on position 85 if the

record is only 74 characters long).

The next prompt concerns the order in which you want to sequence your records - ascending or descending. Type a "0" for ascending or a "1" for descending and press RETURN. Ascending would put records with lower key values in front of the sequence, descending would put them at the rear.

At this point, one of two programs will load from the diskette containing the sort utility, depending on whether you had selected fixed or variable length records.

You will then enter the name of the file that you want to sort. Enter the complete filespec (e.g. D1:TESTFILE.DAT) and press RETURN. There must be enough free space on the diskette to store half of the file. For example, if the file is 400 sectors long, there must be at least 200 free sectors for this temporary storage. Because of this storage factor, the largest file that SORT can handle is approximately 470 sectors ( $470 \times 1.5 = 705$  sectors). For files this large you must copy the file to a formatted diskette that does NOT contain DOS (there are only 626 sectors left with DOS on the diskette).

The last entry that you will make concerns the destination disk for the sorted file. If you have one disk drive, you must type a "1" to this prompt. If you have two or more drives, you can optionally sort the file onto drive number 2, 3 or 4. Larger files can be handled with multiple drives.

SORT will then begin to sort your file. Numerous system messages will display during this process. Depending on the amount memory in your computer and the size of the file, SORT will execute either one or two passes to load and sort the records. The file D:TEMP is used to store the output of the first pass. Your original file and D:TEMP will be deleted at the end of the process. The remaining file (same name as your original) is the one that has been sorted to your specifications. If you have two or more disk drives and requested that the new file be placed on a different disk, the original will NOT be erased.

## ADVANCED TECHNICAL INFORMATION

### SYSTEM ELEMENTS & DESIGN - SORT

SORT is comprised of four programs - SORT, SORTXX, SORT.FIX and SORT.VAR. The first "POKE's" the machine language program into memory and then loads the SORTXX program. Your initial selections are captured here and poked into memory. The two main programs load the file (in one or two passes depending on its size), calls the machine language routine to sort the string containing the records, and then optionally merges the two smaller files together. If one pass is used to load the data then the last step is not executed "SORT.VAR" (variable length) also reads the file first to find the maximum record length and then inserts the actual length of the record in front and buffers the end with blank spaces. The record length (stored in binary) is used when the file is re-written to diskette.

The parameters controlling the machine language routine (and their memory locations) are:

Description	Decimal Address
Beginning of Sort Key	203
End of Sort Key	204
Record Length	205
Type (Ascending - 0 or descending - 1)	206

Note that the sort key positions are the "offset" of those bytes from the beginning of the record. For example, the first byte of the record has a "0" offset, the second is "1" and the nth is (n-1). Also, note that the variable length option inserts the record length in FRONT of the record, thereby pushing the data back by one position.

The routine itself resides in memory locations 1664 to 1789 (decimal) or 0680 to 06FD (hex). A USR function is used to execute the sub-routine. The USR function MUST pass two additional parameters to the routine the address of the string containing the file and the record count. The statement would be A=USR(1664,ADR(X\$),RC).

Both the BASIC sort/merge routines and the machine language sort can be modified or used with other programs. To utilize the machine language routine, you must load the above memory addresses with the required parameters and then call it, passing the string address and number of records in process. Both the source and object files are on the program diskette for those who would like to experiment. You will need an ASSEMBLER/EDITOR cartridge to modify the machine language program.

The BASIC sort/merge programs can also be called from other programs by adding a RUN "D:;SORT" instruction in your software (note: the SORT program is called first to load the machine language routine; it will call SORTXX). Add the code to POKE the above addresses with the parameters and remove the prompts within SORTXX, SORT.FIX and SORT.VAR that perform this function. The input for the file name can be replaced with "F\$=D:;filename". The END statement in line 410 may be replaced with RUN "D:;programe" where programe is the name of your calling program.

## USING OTHER PRINTERS

LISTER and COMPARE are coded to work with the ATARI 825 printer. Other printers (e.g., EPSON MX-80) can be used with these programs if you make one change in each of the programs.

First turn on your computer system a DOS II diskette. Insert the program diskette and type LOAD "D:LISTER" and press RETURN. The program will load but not execute. Type LIST 40 and press RETURN. The following statement will display on your screen:

```
40 N$"␣+":C$="␣"
```

The variables N\$ and C\$ represent the printer control codes for the NORMAL and CONDENSED type fonts. Locate the printer control codes for these functions in your printer instruction manual. The "normal" font is sometimes referred to as "cancel condensed". Replace the values assigned to N\$ and C\$ in the program with those required by your printer. The ATASCII CHARACTER SET chart in Appendix C of the ATARI BASIC REFERENCE MANUAL may help you in converting the decimal or hexadecimal values in the printer manual to the required ATASCII characters. Use the cursor control keys (CONTROL and up, down, left, right, insert, delete) to move the cursor to the applicable location on line 40 and insert the new values. Some printers (e.g., EPSON) use a one character control code while others (ATARI 825) use two. Delete the second position if it is not needed.

Line 40 for an EPSON printer would then look like:

```
40 N$="␣":C$="␣"
```

Press RETURN after making the change and then insert the formatted (and un-locked) diskette in your disk drive. Type SAVE "D:LISTER" and press RETURN. The new version of the program will be saved on this diskette (NOTE: The UTILITY DISKETTE II diskette does not have a notch and is, therefore, write-protected). The COMPARE program can be modified in the same manner.

## KEY LEGEND FOR UNPRINTABLE CHARACTERS

LETTERS IN BRACKETS [ ] ARE INVERSE VIDE0 EXCEPT FOR:

[CON-X] WHERE X IS A LETTER KEY

[CLR] = ESC-SHIFT-CLEAR

[TAB] = ESC-TAB

[DWN] = ESC-CTRL-EQUAL

[UP ] = ESC-CTRL-MINUS

[LEF] = ESC-CTRL-PLUS

[RIT] = ESC-CTRL-ASTERISK

[INS] = ESC-CTRL-INSERT

[DEL] = ESC-CTRL-DELETE

[ILN] = ESC-SHIFT-INSERT

[DLN] = ESC-SHIFT-DELETE

[SET] = ESC-SHIFT-TAB

[CLT] = ESC-CTRL-TAB

[BEL] = ESC-CTRL-2

```

20 DIM R$(150),P$(300),T1$(20),T2$(50),F$(15),T$(15),H1$(75),H2$(75),A$(2),
N$(2),C$(2)
30 T1$="[CLR][DWN][UP ][RIT][LEF][TAB][SET][CLT][INS][DEL][ILN][DLN][BEL]":
T2$="CLRDWNUP RITLEFTABSETCLTINSDELILNDLNBEL":LT=LEN(T1$)
40 N$="[CON-R]":C$="[CON-O]":POKE 82,1
50 GRAPHICS 0:?"[DWN][TAB] [ PROGRAM LISTER ]":?"[DWN][TAB](C) 1982 RL
M MICRO SYSTEMS":POKE 16,64:POKE 53774,64
60 ? "[DWN]PROGRAM MUST BE IN LIST FORMAT. JUST":?"PRESS RETURN TO CANCEL.
"
70 F$="D1:":?"[DWN]ENTER FILE NAME ==> ":INPUT T$:IF LEN(T$)=0 THEN 420
100 TRAP 130:IF T$(2,2)="/" OR T$(3,3)="/" THEN F$=T$:GOTO 130
110 F$(4)=T$
130 TRAP 40000:?"INSERT ";F$:?" IN DISK DRIVE":?"PRESS [RETURN] ":INPUT T
$
132 TRAP 900:OPEN #2,4,0,F$:RC=0:TRAP 40000:?"ENTER:"
135 PL=75:?"PRINT LINE WIDTH => 75[LEF][LEF][LEF]":TRAP 135:INPUT PL:TRAP
40000
136 IF PL<39 OR PL>131 THEN 135
140 A$=N$:?"[IN] NORMAL [C] COMPRESSED TYPE => N[LEF][LEF]":INPUT T$:IF T
$="C" THEN A$=C$
142 IF A$=N$ AND PL>79 THEN ? "PRINT LINE TOO LONG":GOTO 135
145 ? "1ST HEADER LINE":INPUT H1$:?"2ND HEADER LINE":INPUT H2$
146 FN=1:LP=58:?"# OF LINES/PAGE => 58[LEF][LEF][LEF]":TRAP 150:INPUT LP
:IF LP>63 THEN 146
147 I=1:?"PRINT KEY LEGEND (Y/N) Y[LEF][LEF]":INPUT T$:IF T$(1,1)<>"Y" T
HEN I=0
152 CLOSE #3:?"CHECK PRINTER & PAPER":GOSUB 940
155 TRAP 152:OPEN #3,8,0,"P:":?"#3:A$":IF LEN(H1$)>0 THEN ? #3:H1$:?"#3:RC=A
C+2
156 IF LEN(H2$)>0 THEN ? #3:H2$:?"#3:RC=RC+2
160 IF I=0 THEN 200
165 ? #3," KEY LEGEND FOR UNPRINTABLE CHARACTERS":?"#3
170 ? #3," LETTERS IN BRACKETS [ ] ARE INVERSE VIDE0 EXCEPT FOR:":?"#3
171 ? #3," [CON-X] WHERE X IS A LETTER KEY"
172 ? #3," [CLR] = ESC-SHIFT-CLEAR [TAB] = ESC-TAB"
174 ? #3," [DWN] = ESC-CTRL-EQUAL [UP ] = ESC-CTRL-MINUS"
176 ? #3," [LEF] = ESC-CTRL-PLUS [RIT] = ESC-CTRL-ASTERISK"
178 ? #3," [INS] = ESC-CTRL-INSERT [DEL] = ESC-CTRL-DELETE"
180 ? #3," [ILN] = ESC-SHIFT-INSERT [DLN] = ESC-SHIFT-DELETE"
182 ? #3," [SET] = ESC-SHIFT-TAB [CLT] = ESC-CTRL-TAB"
184 ? #3," [BEL] = ESC-CTRL-2":?"#3:RC=RC+13
200 TRAP 400:INPUT #2,R$:TRAP 40000:RC=RC+1
210 L=1:FOR I=1 TO LEN(R$):A=ASC(R$(I,1)):IF A<32 OR A>124 THEN 225

```

```

215 IF SW=1 THEN P$(L)="I":L=L+1:SW=0
220 P$(L)=R$(I,I):GOTO 310
225 IF SW=0 THEN P$(L)="I":L=L+1
227 IF A>155 AND A<160 THEN 260
230 IF A>127 AND A<253 THEN P$(L)=CHR$(ASC(R$(I,I))+128):SW=1:GOTO 310
240 IF A=0 THEN P$(L)="CON-":L=L+4:GOTO 300
250 IF A<27 THEN P$(L)="CON-":L=L+4:P$(L)=CHR$(ASC(R$(I,I))+64):GOTO 300
260 K=0:FOR J=1 TO LT:IF R$(I,I)=T1$(J,J) THEN P$(L)=T2$(J*3-2,J*3):L=L-2:J=J+1
265 NEXT J:IF K=0 THEN P$(L,L)="? "
300 L=L+1:P$(L)="I":SW=0
310 L=L+1:NEXT I:C=LEN(P$):A=C:B=C
320 IF C>PL THEN A=PL:IF C>PL*2 THEN B=PL*2
330 ? #3:P$(1,A):IF B>A THEN ? #3:P$(A+1,B):RC=RC+1:IF C>B THEN ? #3:P$(B+1,B):RC=RC+1
350 IF RC<LF THEN 200
360 FOR I=RC TO 65: ? #3:NEXT I:PN=PN+1:RC=2: ? #3:H1$:" PAGE ":PN: ? #3:GOTO 200
400 ? : ? "RUN AGAIN ? (Y/N) ":INPUT T$:IF T$="Y" THEN RUN
420 GRAPHICS 0:END
900 CLOSE #2: ? "[BEL] DISK ERROR- ":PEEK(195):GOTO 400
940 ? "PRESS [RETURN] WHEN READY":INPUT T$:RETURN

```

figure 5. Sample Lister Output

# BASIC PROGRAM COMPARISON

PROGRAMS - (1) D1:COMPARE1.LST  
(2) D1:COMPARE2.LST

2 - 10 REM TEST VERSION OF COMPARE

1 - 65 ? "ENTER: (Dn:name.ext)"

1 - 75 GOSUB 920:N1\$=I\$

1 - 85 PG=23:LP=22:?:? PRESS [SPACE] TO STOP":?:? "SELECT:"

2 - 85 PG=20:LP=40:?:? PRESS [SPACE] TO STOP"

## LINES OF CODE:

D1:COMPARE1.LST - 47

D1:COMPARE2.LST - 46

## DIFFERENCES:

SAME LINE # - 1

IN D1:COMPARE1.LST ONLY - 2

IN D1:COMPARE2.LST ONLY - 1

*figure 6. Sample Compare Output*



**Limited Warranty on Media and Hardware Accessories.** We, Atari, Inc., guarantee to you, the original retail purchaser, that the medium on which the APX program is recorded and any hardware accessories sold by APX are free from defects for thirty days from the date of purchase. Any applicable implied warranties, including warranties of merchantability and fitness for a particular purpose, are also limited to thirty days from the date of purchase. Some states don't allow limitations on a warranty's period, so this limitation might not apply to you. If you discover such a defect within the thirty-day period, call APX for a Return Authorization Number, and then return the product along with proof of purchase date to APX. We will repair or replace the product at our option.

You void this warranty if the APX product: (1) has been misused or shows signs of excessive wear; (2) has been damaged by use with non-ATARI Home Computer products; or (3) has been serviced or modified by anyone other than an Authorized ATARI Computer Service Center. Incidental and consequential damages are not covered by this warranty or by any implied warranty. Some states don't allow exclusion of incidental or consequential damages, so this exclusion might not apply to you.

**Disclaimer of Warranty and Liability on Computer Programs.** Most APX programs have been written by people not employed by Atari, Inc. The programs we select for APX offer something of value that we want to make available to ATARI Home Computer owners. To offer these programs to the widest number of people economically, we don't put APX products through rigorous testing. Therefore, APX products are sold "as is," and we do not guarantee them in any way. In particular, we make no warranty, express or implied, including warranties of merchantability and fitness for a particular purpose. We are not liable for any losses or damages of any kind that result from use of an APX product.

---

---

**For the complete list of current  
APX programs, ask your ATARI retailer  
for the APX Product Catalog**

---

---

[illegible]

1. The first step in the process of identifying a problem is to define the problem. This involves identifying the symptoms of the problem and determining the scope of the problem. Once the problem has been defined, the next step is to identify the causes of the problem. This involves identifying the factors that are contributing to the problem and determining the underlying causes. Once the causes have been identified, the next step is to develop a plan to address the problem. This involves identifying the actions that need to be taken to address the problem and determining the resources that will be needed to implement the plan. Finally, the last step in the process is to implement the plan and monitor the results. This involves putting the plan into action and tracking the progress of the plan to ensure that the problem is being addressed effectively.

1. The first step in the process of identifying and evaluating potential risks is to conduct a thorough review of the project's objectives, scope, and timeline. This involves understanding the project's goals, the resources available, and the constraints that may affect the project's progress. By clearly defining the project's parameters, the project manager can identify the areas where risks are most likely to occur.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

## Review Form

We're interested in your experiences with APX programs and documentation, both favorable and unfavorable. Many of our authors are eager to improve their programs if they know what you want. And, of course, we want to know about any bugs that slipped by us, so that the author can fix them. We also want to know whether our

instructions are meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program.

---

---

2. If you have problems using the program, please describe them here.

---

---

---

3. What do you especially like about this program?

---

---

---

4. What do you think the program's weaknesses are?

---

---

---

5. How can the catalog description be more accurate or comprehensive?

---

---

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program:

- \_\_\_\_\_ Easy to use
- \_\_\_\_\_ User-oriented (e.g., menus, prompts, clear language)
- \_\_\_\_\_ Enjoyable
- \_\_\_\_\_ Self-instructive
- \_\_\_\_\_ Useful (non-game programs)
- \_\_\_\_\_ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

---

---

---

8. What did you especially like about the user instructions?

---

---

---

9. What revisions or additions would improve these instructions?

---

---

---

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

---

---

11. Other comments about the program or user instructions:

---

---

---

From

---

---

---

STAMP

ATARI Program Exchange  
P.O. Box 3705  
Santa Clara, CA 95055

[seal here]